-BAND STEREO RADIO CASSETTE RECORDER

MODEL NO. TPR-950E,K

AIWA®

[SERVICE MANUAL]

Shown above is TPR-950K

DATE OF ISSUE 9/1978

SPECIFICATIONS

GENERAL

Semiconductors:	4 IC's, 1 FET, 45 transistors, 19 diodes, 3 LED's
Power Source:	Batteries DC 9V (UM-1 x 6) AC 120V/220V (E model) AC 120V/240V (K model) (switchable) 50/60 Hz
Power consumption:	17W (E model), 20W (K model)
Speakers:	Woofer 160 mmϕ x 2 Tweeter 52 mmϕ x 2
Demension:	490(W) x 370(H) x 130(D) mm
Weight:	7 kg (including batteries)
Supplied accessories:	AC power cord x 1 Cassette tape x 1 Batteries (SUM-1) x 6 Head cleaning stick x 1

RADIO SECTION

Circuit:	Superheterodyne	
Frequency range:	FM87.5~108 MHz SW_1 5.7~18.5 MHz SW_2 5.8~6.5 MHz (49 m Band) MW515~1650 kHz LW145~320 kHz	
Intermediate frequency:	FM 10.7 MHz SW_1, SW_2, MW, LW 455 kHz (E model) SW_1, SW_2, MW, LW 468 kHz (K model)	
Sensitivity:	FM	4±3 dB (at 88 MHz) 3±3 dB (at 98, 108 MHz)
(at S/N 6 dB) (at S/N 10 dB)	SW_1	28±5 dB (at 5.9 MHz) 20±5 dB (at 12, 18 MHz)
(at S/N 10 dB)	SW_2	28±5 dB (at 5,95, 6.1, 6.2 MHz)
(at S/N 10 dB)	MW	43±4 dB (at 600 kHz) 42±4 dB (at 1000, 1400 kHz)
(at S/N 14 dB)	LW	53±5 dB (at 150 kHz) 50±5 dB (at 220, 300 kHz)

FM stereo separation:	30±5 dB (at 1 kHz)
Antennas:	Built-in whip antenna for FM, SW_1, SW_2 Built-in ferrite bar antenna for MW, LW

TAPE RECORDER SECTION

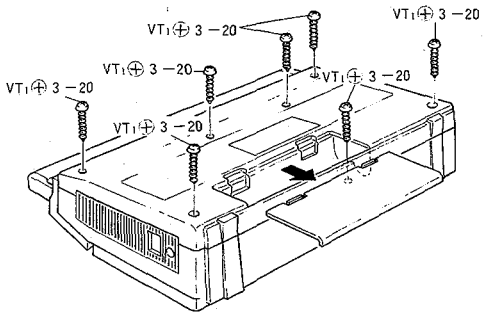
Tape speed:	4.76 cm/sec. ±2.5%
Recording system:	AC bias
Erasing system:	AC erase
Record bias frequency:	54.5 kHz
Distortion:	Less than 1.7% (PB) Less than 3.0% (REC/PB)
Frequency response:	Normal (LH) tape: 50~12,000 Hz CrO_2 tape: 50~14,000 Hz Fe-Cr tape: 50~14,000 Hz
Signal to noise ratio: (Un-Weighted)	More than 50/46 dB [DC/AC] (PB) More than 43/42 dB [DC/AC] (REC/PB)
Erasing ratio:	More than 55 dB
Separation:	More than 35 dB (REC/PB)
Maximum output power:	9.4W (4.7W + 4.7W)
Head:	Ferrite guard head (FGH)
FF & rewind time:	80±5 sec.
Automatic stop system:	Mechanical full auto stop
Automatic shut-off action time:	Less than 10 sec.
Pinch roller pressure:	300±30g
Wow & Flutter:	Less than 0.09% (WRMS)
Take-up torque:	50±10 g-cm
FF & rewind torque:	$100\ ^{+20}_{-10}$ g-cm

- The specifications and external appearance of this set are subject to change without prior notice.

DISASSEMBLY INSTRUCTIONS

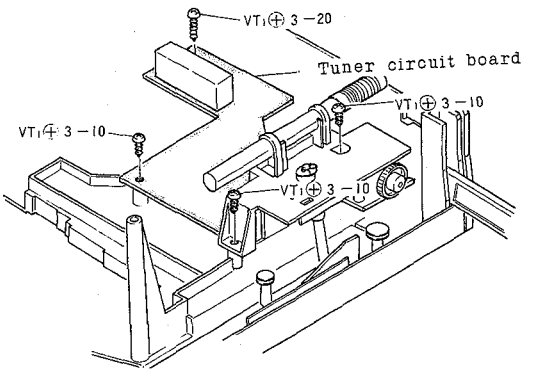
To Remove Back Cover

Remove 7 screws.



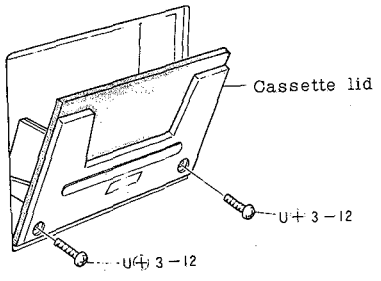
To Remove Tuner Circuit Board

Remove 4 screws.



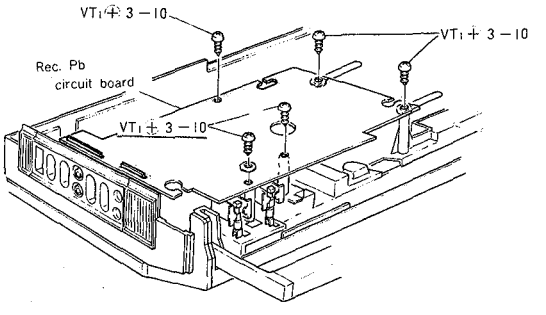
To Remove Cassette Lid

Remove 2 screws.



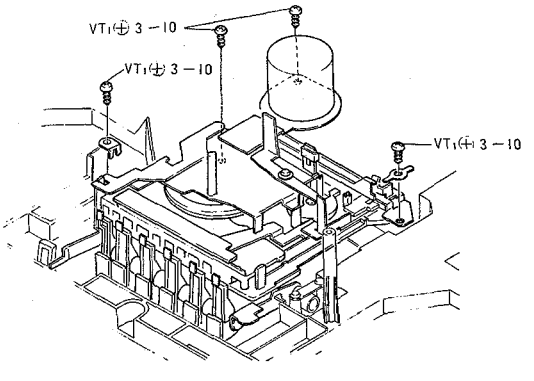
To Remove REC/PB Circuit Board

Remove 5 screws.



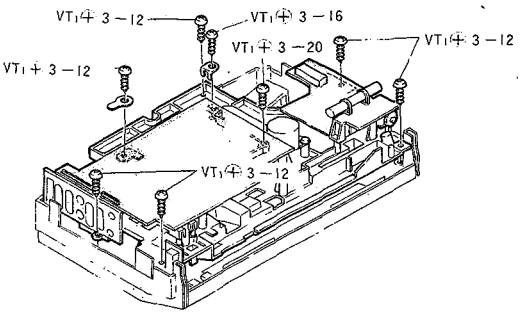
To Remove Mechanism

Remove 4 screws.

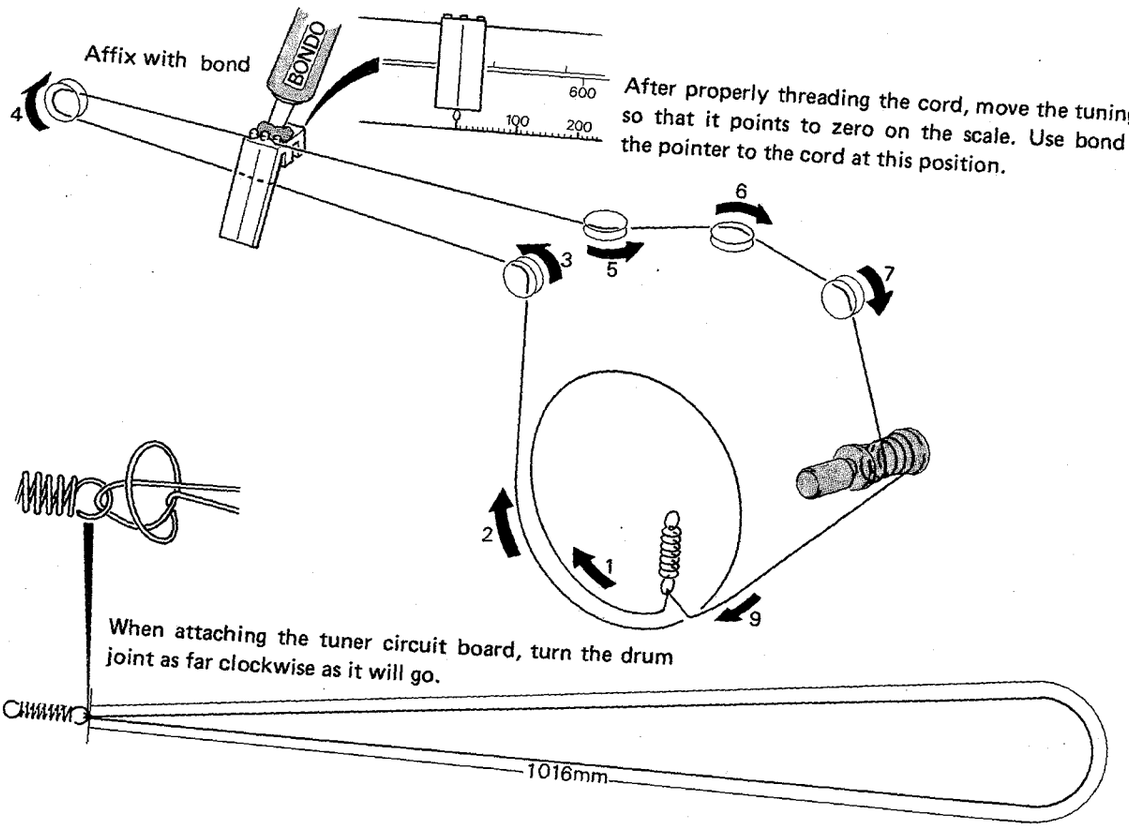


To Remove Main Cabinet

Remove 8 screws.



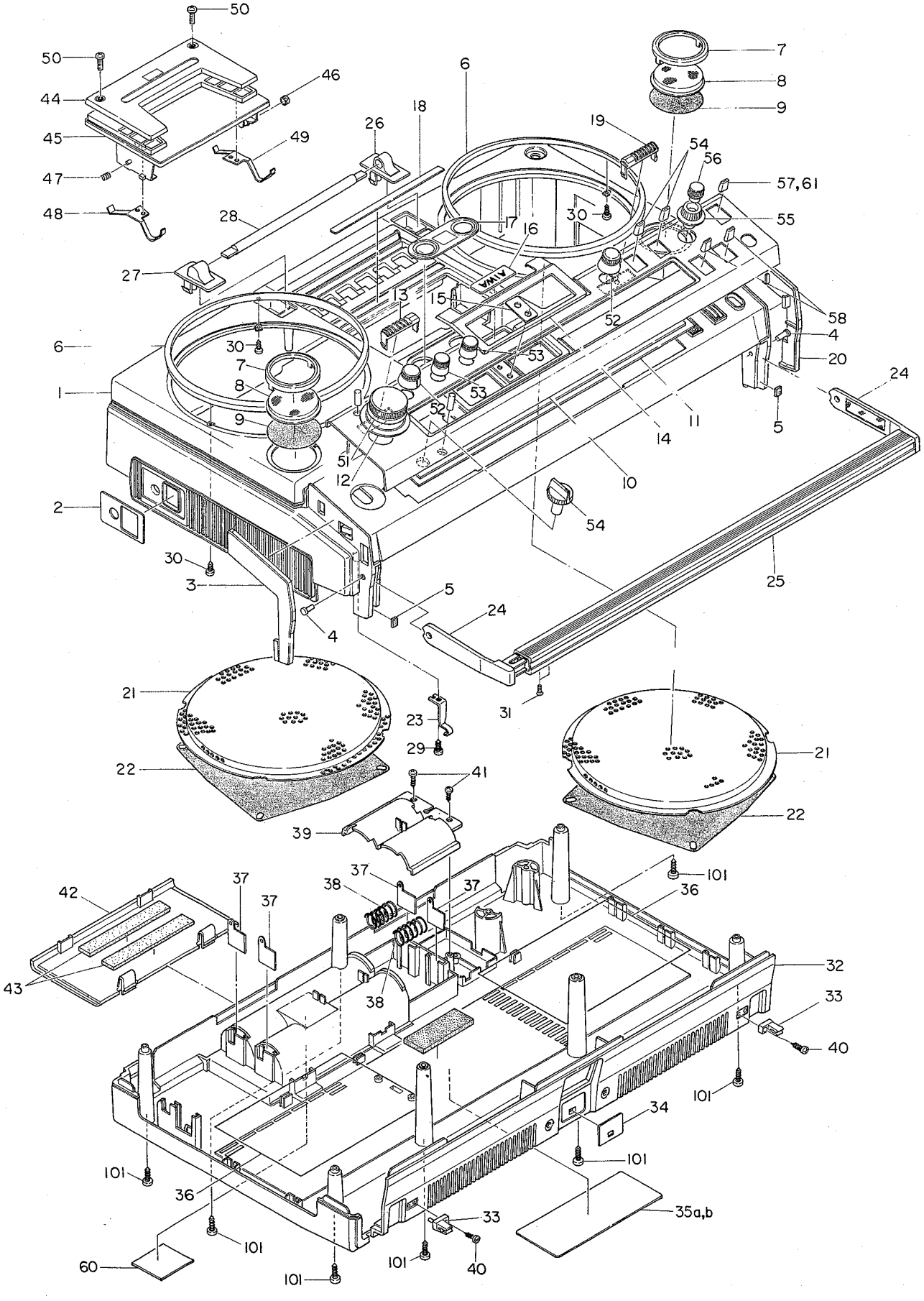
DIAL CORD STRINGING



After properly threading the cord, move the tuning pointer so that it points to zero on the scale. Use bond to affix the pointer to the cord at this position.

When attaching the tuner circuit board, turn the drum joint as far clockwise as it will go.

EXPLODED VIEW–1



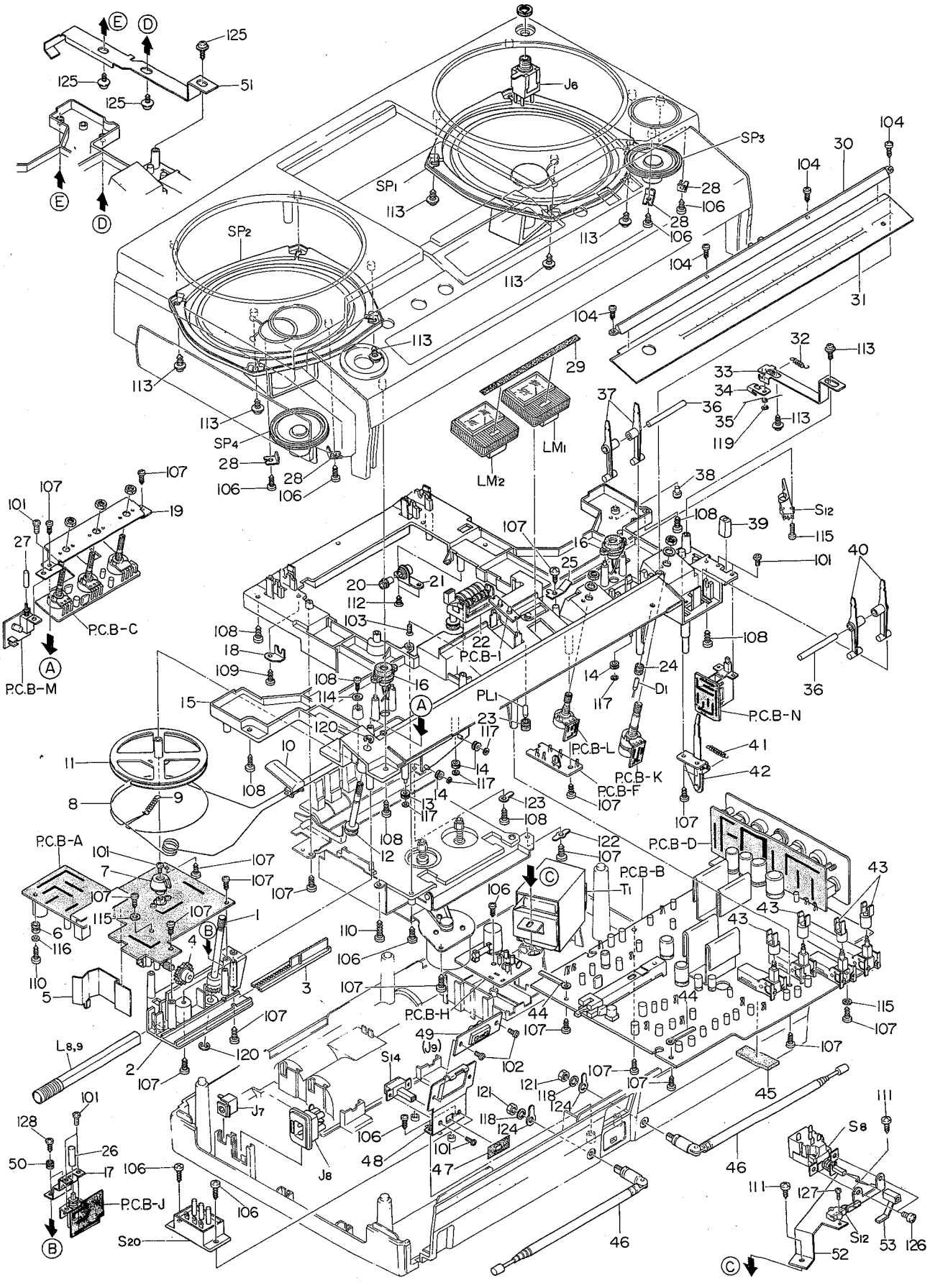
PARTS LIST

MECHANICAL PARTS

■ * mark in this part list shows exclusive part (which is used) for only Model TPR-950.

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1~43	**09-017-495-01**		**Cabinet Assembly — "E" model (Main case ass'y + Back cover ass'y + Battery room lid ass'y)**		
1~43	**09-017-498-01**		**Cabinet Assembly — "K" model (Main case ass'y + Back cover ass'y + Battery room lid ass'y)**		
1~31	**09-017-496-01**		**Main case ass'y — E model**		
1~31	**09-017-499-01**		**Main case ass'y — K model**		
1-1	82-541-095-01		Main case ass'y	*	1
1-2	82-541-070-01		Name plate, AC jack	*	1
1-3	82-541-019-01		Side panel R	*	1
1-4	82-541-267-01		Shaft, Carrying handle	*	1
1-5	82-445-253-01		Rubber A, Carrying handle		2
1-6	82-541-005-01		Ring, Speaker (Woofer)	*	2
1-7	82-541-037-01		Ring, Speaker (Tweeter)	*	2
1-8	82-541-039-01		Net, Speaker (Tweeter)	*	2
1-9	82-541-054-01		Dust screen cloth, Speaker (Tweeter)	*	2
1-10a	82-541-067-01		Panel, Main case (E model only)	*	1
1-10b	82-541-077-01		Panel, Main case (K model only)	*	1
1-11	82-541-073-01		Dial window ass'y	*	1
1-12	82-541-035-01		Decorative plate, Tuning knob	*	1
1-13	82-541-016-01		Grille R, ECM	*	1
1-14	82-541-011-01		Panel, Meter	*	1
1-15	82-541-057-01		Peak indicator plate	*	1
1-16	82-541-038-01		Badge, AIWA	*	1
1-17	82-534-048-01		Cassette plate	TPR-980	1
1-18	82-541-064-01		Plate A	*	1
1-19	82-541-017-01		Grille L	*	1
1-20	82-541-020-01		Side panel L	*	1
1-21	82-541-018-01		Panching (Woofer)	*	2
1-22	82-541-046-01		Dust screen cloth, Speaker	*	2
1-23	82-534-203-01		Click plate spring R	TPR-980	1
1-24	82-534-013-01		Handle arm R	TPR-980	2
1-25	82-541-013-01		Handle grip	*	1
1-26	82-541-065-01		Mold plate, L	*	1
1-27	82-541-069-01		Mold plate, R	*	1
1-28	82-541-073-01		Shaft, Button guard	*	1
1-29	82-351-096-21		VT_1 + 3-10		1
1-30	87-341-035-21		UT_1 + 2-6		6
1-31	87-081-827-01		QTT_2 + 3-8 (Black nickle)		4
32~41	**09-017-497-01**		**Back cover ass'y — E model only**		
32~41	**09-017-500-01**		**Back cover ass'y — K model only**		
1-32	82-541-002-01		Back cover	*	1
1-33	82-422-024-01		Holder, Antenna		2
1-34	82-541-075-01		Antenna plate	*	1
1-35a	82-541-071-01		Name plate, Spec. (E model only)	*	1
1-35b	82-541-072-01		Name plate, Spec. (K model only)	*	1
1-36	82-541-045-01		Dust screen cloth, Back cover	*	2
1-37	87-038-032-01		Battery terminal plate		4
1-38	82-222-036-01		Battery terminal spring		2
1-39	82-541-228-01		Battery case	*	1
1-40	87-351-035-01		VT_1 + 2-6		2
1-41	87-351-095-01		VT_1 + 3-8		2
1-42	82-541-003-01		Battery room lid	*	1
1-43	82-416-260-01		Cushion, Battery room lid		2
44~50	**09-017-501-01**		**Cassette lid ass'y**		
1-44	82-541-010-01		Cassette lid plate	*	1
1-45	82-541-007-01		Cassette lid ass'y	*	1
1-46	82-461-319-01		Cushion, Cassette lid		1
1-47	82-541-249-01		Spring, Cassette box	*	1
1-48	82-541-264-01		Pressure plate spring R	*	1
1-49	82-541-265-01		Pressure plate spring L	*	1
1-50	82-541-051-01		U + 3-12	*	2
1-51	82-541-041-01		Tuning knob ass'y	*	1
1-52	82-541-021-01		Volume knob A	*	2
1-53	82-541-022-01		Volume knob B	*	2
1-54	82-541-044-01		Knob A, Lever switch S	*	2
1-55	82-541-023-01		Volume knob C	*	1
1-56	82-541-024-01		Volume knob D	*	1
1-57	82-541-052-01		Sleep knob (E model only)	*	1
1-58	82-541-050-01		Knob B, Lever switch S	*	2
1-59	82-541-025-01		Band knob	*	1
1-60	82-541-092-01		Battery plate	*	1
1-61	82-541-076-01		Knob, Power switch (K model only)	*	1

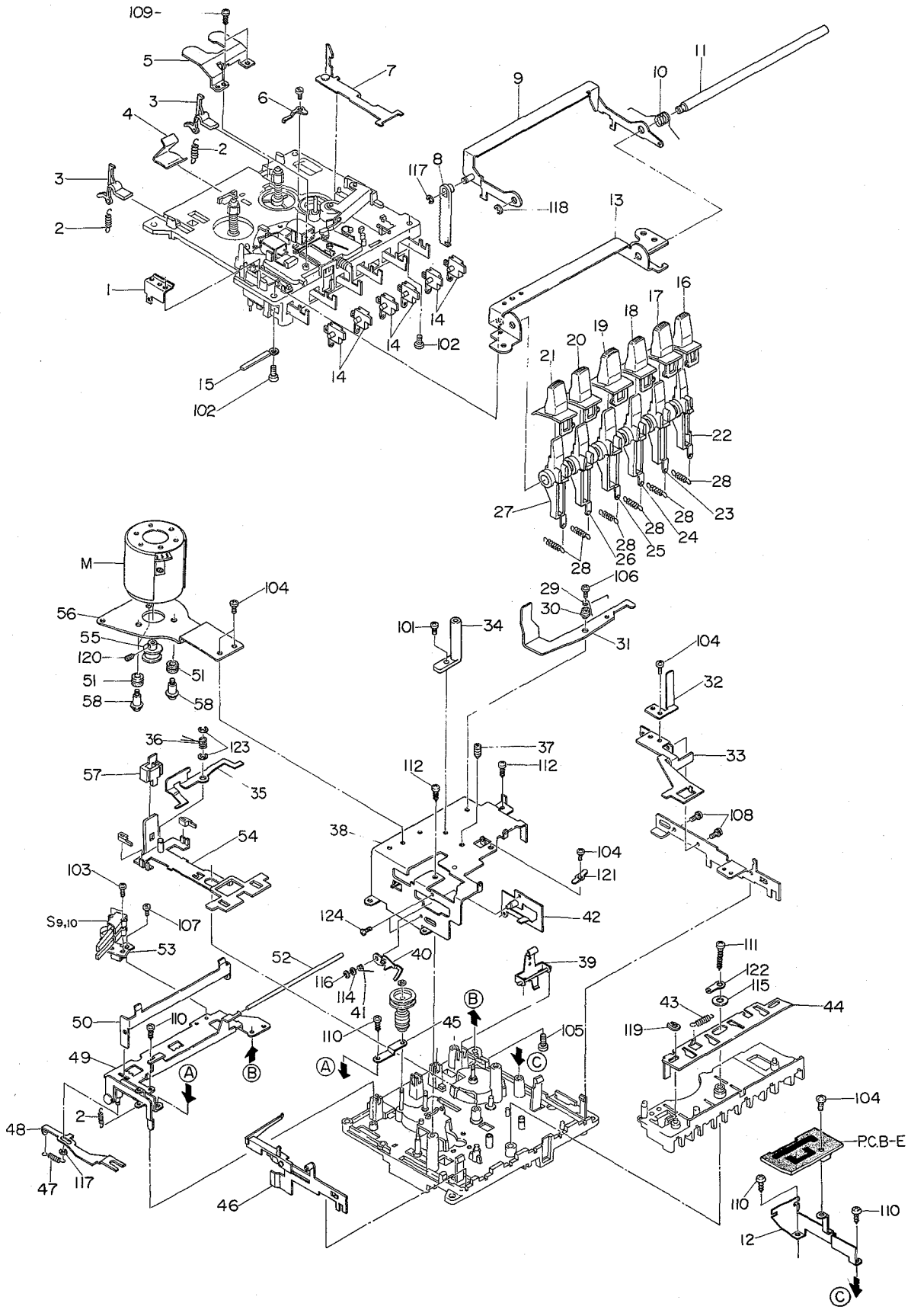
EXPLODED VIEW–2



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
2-1	82-541-205-01		Gear C, Band selector	*	1
2-2	82-541-202-01		Chassis, Tuning	*	1
2-3	82-541-204-01		Gear B, Band selector	*	1
2-4	82-541-203-01		Gear A, Band selector	*	1
2-5	82-535-616-01		Shield plate	TPR-915	1
2-6	87-087-029-01		Rubber cushion		1
2-7	82-439-311-01		Drum joint	TPR-905	1
2-8	87-096-045-01		Dial string		1
2-9	82-534-290-01		Spring	TPR-980	1
2-10	82-541-014-01		Dial pointer	*	1
2-11	82-439-310-01		Drum	TPR-300	1
2-12	82-541-232-01		Shaft, Tuning dial	*	1
2-13	81-302-107-01		Roller		1
2-14	81-385-014-01		Roller		4
2-15	82-541-201-01		Chassis, Radio	*	1
2-16	87-064-063-01		Holder A, ECM		2
2-17	82-541-299-01		Metal fitting	*	1
2-18	82-541-280-01		Metal fitting, Push button shaft	*	1
2-19	82-541-226-01		Metal fitting, Volume	*	1
2-20	82-534-264-01		Gear, Oil-damper	TPR-980	1
2-21	82-534-250-01		Metal fitting, Oil-damper ass'y	TPR-980	1
2-22	87-040-103-01		Counter		1
2-23	82-463-216-01		Rubber bushing		1
2-24	87-087-027-01		Rubber cushion		1
2-25	82-541-275-01		Plate spring	*	1
2-26	82-541-061-01		Knob	*	1
2-27	82-545-016-01		Push button, LOUDNESS		1
2-28	82-541-235-01		Metal fitting, Tweeter	*	4
2-29	82-541-059-01		Himeron cloth, Meter	*	1
2-30	82-541-012-01		Reflector board	*	1
2-31	82-541-066-01		Dial plate	*	1
2-32	82-541-243-01		Spring, Sleep lever (E model only)	*	1
2-33	82-541-233-01		Sleep slide lever ass'y (E model only)	*	1
2-34	82-530-223-01		Lock plate (E model only)		1
2-35	82-541-250-01		Spring, Sleep switch (E model only)	*	1
2-36	82-541-246-01		Shaft, Lever switch	*	2
2-37	82-541-251-01		Lever B, Lever switch	*	2
2-38	82-534-254-01		Lock pin, Power switch lever (E model only)	TPR-980	1
2-39	82-541-043-01		Knob, Light switch	*	1
2-40	82-541-244-01		Lever A, Lever switch	*	2
2-41	82-541-245-01		Spring, Sleep metal fitting	*	1
2-42	82-541-236-01		Metal fitting ass'y, Sleep	*	1
2-43	82-541-241-01		Joint, Lever switch	*	4
2-44	87-038-039-01		Wire binder		2
2-45	82-421-261-01		Cushion, Circuit board		1
2-46	87-043-039-01		Whip antenna		2
2-47	82-541-058-01		Himeron cloth, antenna switch	*	1
2-48	82-541-227-01		Metal fitting, External antenna		1
2-49	82-463-088-01		Terminal plate		1
2-50	87-087-027-01		Rubber cushion		2
2-51	82-541-294-01		Slide plate, Power switch (K model only)	*	1
2-52	82-541-295-01		Metal fitting, Power switch (K model only)	*	1
2-53	82-539-213-01		Lever, Power switch (K model only)		1

EXPLODED VIEW–3

As this is a PM-1 mechanism, the exploded view is omitted (see the supplement PM-1 mechanism adjustment manual). The exploded view bellow shows the additional mechanism of the PM-1. Also shown are the attachments of the motor and a list of such.



Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
3-1	82-541-284-01		Plate spring, Wire holder	*	1
3-2	82-541-247-01		Spring	*	2
3-3	82-541-223-01		REC blocking lever	*	2
3-4	82-534-297-01		Pressure plate spring	TPR-980	1
3-5	82-541-628-01		Shield plate, Head	*	1
3-6	82-539-206-01		Earth plate, Erase head	TPR-905	1
3-7	82-541-220-01		Cassette lock lever ass'y	*	1
3-8	82-541-240-01		Lever, Oil-damper	*	1
3-9	82-541-212-01		Cassette box lever ass'y	*	1
3-10	82-541-272-01		Spring	*	1
3-11	82-541-216-01		Shaft, Push button	*	1
3-12	82-541-296-01		Metal fitting, CrO_2 switch	*	1
3-13	82-541-218-01		Metal fitting, Push button	*	1
3-14	82-541-229-01		Selector knob	*	6
3-15	87-038-039-01		Wire binder		1
3-16	82-541-257-01		Push lever, PAUSE	*	1
3-17	82-541-255-01		Push lever, STOP	*	1
3-18	82-541-254-01		Push lever, FF	*	1
3-19	82-541-252-01		Push lever, FWD	*	1
3-20	82-541-253-01		Push lever, REW	*	1
3-21	82-541-256-01		Push lever, REC	*	1
3-22	82-541-031-01		Push key, PAUSE	*	1
3-23	82-541-030-01		Push key, STOP	*	1
3-24	82-541-028-01		Push key, FF	*	1
3-25	82-541-027-01		Push key, FWD	*	1
3-26	82-541-032-01		Push key, REW	*	1
3-27	82-541-029-01		Push key, REC	*	1
3-28	82-541-248-01		Spring, Push lever	*	6
3-29	82-534-271-01		Tspring, REC lever	TPR-980	1
3-30	82-534-212-01		Collar, REC lever	TPR-980	1
3-31	82-541-224-01		Lever, REC	*	1
3-32	82-541-225-01		P spring, REC	*	1
3-33	82-541-281-01		Lever, One-push recording	*	1
3-34	82-541-274-01		Supporter, Circuit board	*	1
3-35	82-439-271-01		Lever, CrO_2 selector	TPR-300	1
3-36	82-534-266-01		Spring, CrO_2 selector	TPR-980	1
3-37	82-385-311-01		Thrust screw	AD-6300	1
3-38	82-541-260-01		Flywheel bearing plate	*	1
3-39	82-541-297-01		Plate spring, CrO_2 selector	*	1
3-40	82-534-294-01		Lock plate	TPR-980	1
3-41	82-534-295-01		T spring A, PAUSE	TPR-980	1
3-42	82-541-302-01		Metal fitting ass'y, Pause lock plate	*	1
3-43	82-283-289-01		Spring, Play idler lever		1
3-44	82-294-215-01		Plate, One-push recording		1
3-45	82-581-286-01		Earth plate, Worm gear		1
3-46	82-541-269-01		Pause lever ass'y	*	1
3-47	82-541-245-01		Spring, Sleep metal fitting	*	1
3-48	82-541-215-01		Slide lever, REC blocking	*	1
3-49	82-541-207-01		Metal fitting ass'y, REC blocking	*	1
3-50	82-541-219-01		Lever, REC blocking	*	1
3-51	87-087-029-01		Rubber cushion		3
3-52	82-541-217-01		Shaft, REC blocking lever	*	1
3-53	82-541-263-01		Metal fitting, Power switch	*	1
3-54	82-439-270-01		Brake plate	TPR-300	1
3-55	82-541-279-01		Motor pulley	*	1
3-56	82-541-230-01		Holder, Motor	*	1
3-57	82-290-212-01		Switch pressure plate		1
3-58	87-081-483-01		Motor screw, M2.6		3

The following is the part number list of the ☆☆☆☆☆ marked parts of the PM-1 mechanism.

Ref. No.	Part No.	Description	Q'ty
1-6	82-439-457-01	Lock plate	1
1-13	82-385-332-01	Spring B, Head adjusting	1
2-33	82-294-217-11	REC lever ass'y	1
2-49	82-541-278-01	Main belt	1
2-50	82-541-276-01	Flywheel ass'y	1
2-51	82-385-314-21	Rubber belt	1
2-52	82-385-311-01	Screw for thrust	1
2-60	82-385-309-21	Worm gear B ass'y	1

Ref. No.	Part No.	Description	Q'ty
1-101	87-351-100-01	VT_1 + 3-20	7

Ref. No.	Part No.	Description	Q'ty
2-101	87-253-073-01	U + 2.6-6	9
2-102	87-253-094-01	U + 3-6	2
2-103	87-231-094-21	Q + 3-6	1
2-104	87-341-036-21	VT_1 + 2-8	4
2-105	87-351-037-21	VT_1 + 2-10	1
2-106	87-351-095-01	VT_1 + 3-8	9
2-107	87-351-096-21	VT_1 + 3-10	23
2-108	82-351-097-21	VT_1 + 3-12	7
2-109	82-351-099-01	VT_1 + 3-16	1
2-110	87-351-102-01	VT_1 + 3-20	2
2-111	87-341-096-01	UT_1 + 3-10	2
2-112	87-231-096-01	QT_1 + 3-10	2
2-113	87-510-095-01	VTF + 3-8	10
2-114	87-081-165-01	W3-10-0.5	1

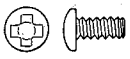
Ref. No.	Part No.	Description	Q'ty
2-115	87-081-015-01	FW3-8-0.5	2
2-116	87-081-017-01	FW3-8-1	1
2-117	87-081-464-01	PW1.8-5-0.5	5
2-118	87-421-309-01	SW-5	2
2-119	87-441-003-01	STE-1.5	1
2-120	87-441-012-01	STE-5	2
2-121	87-421-028-01	N-5	2
2-122	87-450-404-01	LA-4	1
2-123	87-450-414-01	LB-4	1
2-124	87-450-418-01	LB-8	2
2-125	87-511-095-01	VTF + 3-8	3
2-126	87-251-092-01	U + 3-4	2
2-127	87-251-036-71	U + 2-8	1
2-128	87-341-100-21	UT_2 + 3-16	2

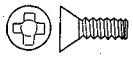
Ref. No.	Part No.	Description	Q'ty
3-101	87-261-093-01	V + 3-5	1
3-102	87-263-094-01	V + 3-6	2
3-103	87-253-038-01	U + 2-12	2
3-104	87-253-092-11	U + 3-4	4
3-105	87-253-094-01	U + 3-6	1
3-106	87-253-095-01	U + 3-8	1
3-107	87-081-236-01	VS + 2-4	2
3-108	87-084-071-01	VS + 2.6-4	3
3-109	87-351-072-01	VT_1 + 2.6-4	2
3-110	87-351-095-01	VT_1 + 3-8	2
3-111	87-081-551-01	VT_1 + 3-21	1
3-112	87-342-074-01	UT_1 + 2.6-8	2

Ref. No.	Part No.	Description	Q'ty
3-113	87-081-501-01	VTT + 2.6-4	1
3-114	82-277-323-01	W2.2-6-0.3	2
3-115	87-081-165-01	W3-10-0.5	1
3-116	87-441-003-01	STE-1.5	2
3-117	87-441-009-01	STE-3	4
3-118	87-441-011-01	STE-4	1
3-119	87-442-003-01	STP-3	1
3-120	87-374-071-01	SS2.6-4	1
3-121	87-450-404-01	LA-4	1
3-122	87-450-414-01	LB-4	1
3-123	87-441-006-01	STE-2.3	2
3-124	87-261-033-21	V + 2-4	2

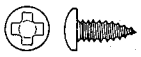
HARDWARE NOMENCLATURE

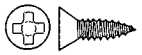
V: Pan head screw

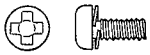
U: Binding head screw 

Q: Flat countersunk head screw 

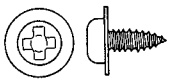
VT1: Pan head tapping screw

UT1: Binding head tapping screw 

QT1: Flat countersunk head tapping screw 

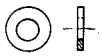
VS: Pan head screw with spring washer 

VTT: Pan head tap-tight screw

VTF: Flange and Pan head tapping screw 

N: Nut

STE: E ring

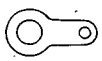
W: Washer 

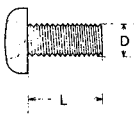
FW: Fiber washer

PW: Poly-slider washer

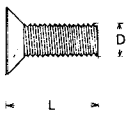
SW: Spring washer

LA: Lug terminal plate

LB: Lug terminal plate 

Example: 

V + 3 – 6
- 6 — Length in mm
- 3 — Diameter in mm
- V — Type of Slot
- + — Type of Head

Example: 

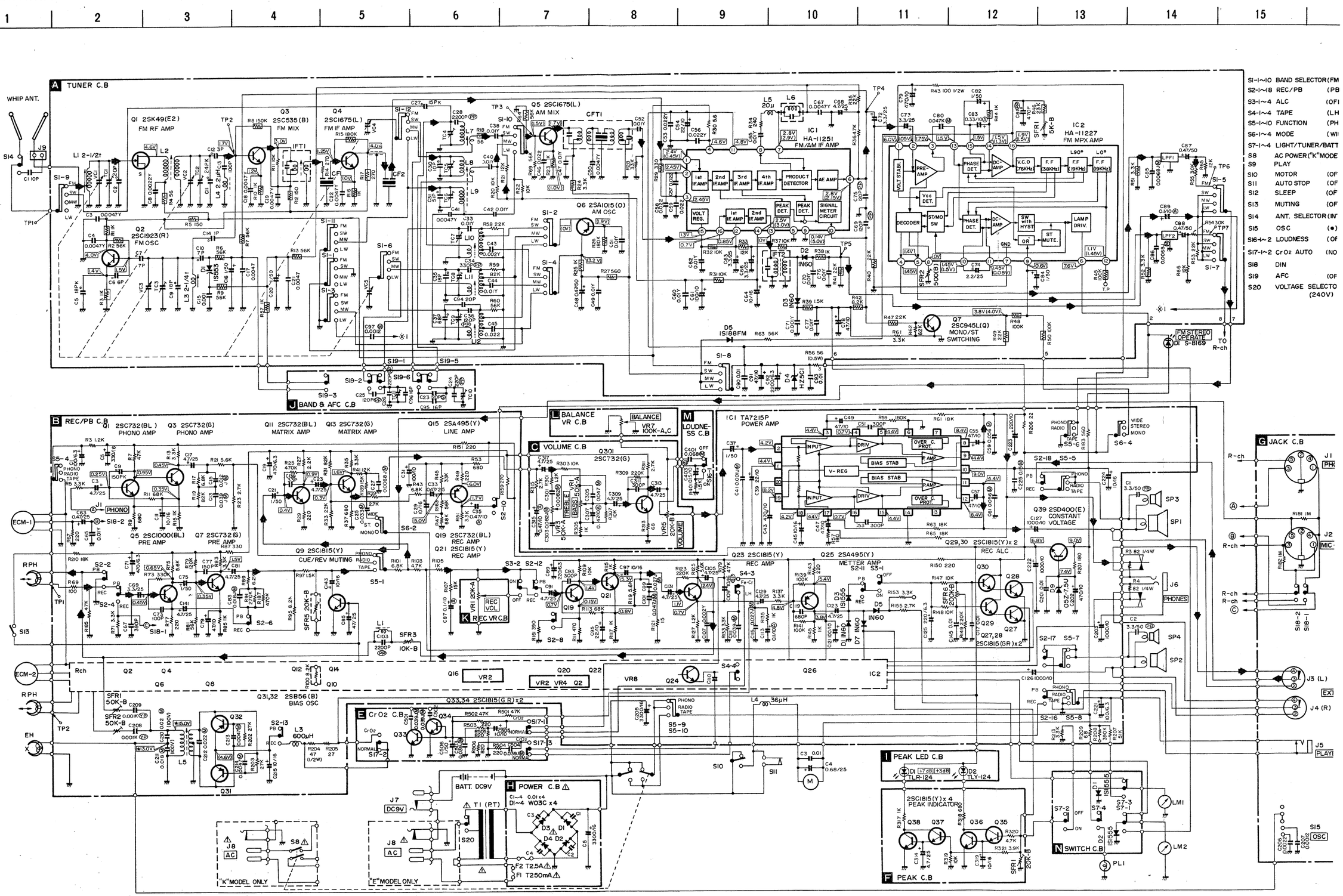
Q + 3 – 6
- 6 — Length in mm
- 3 — Diameter in mm
- Q — Type of Slot
- + — Type of Head

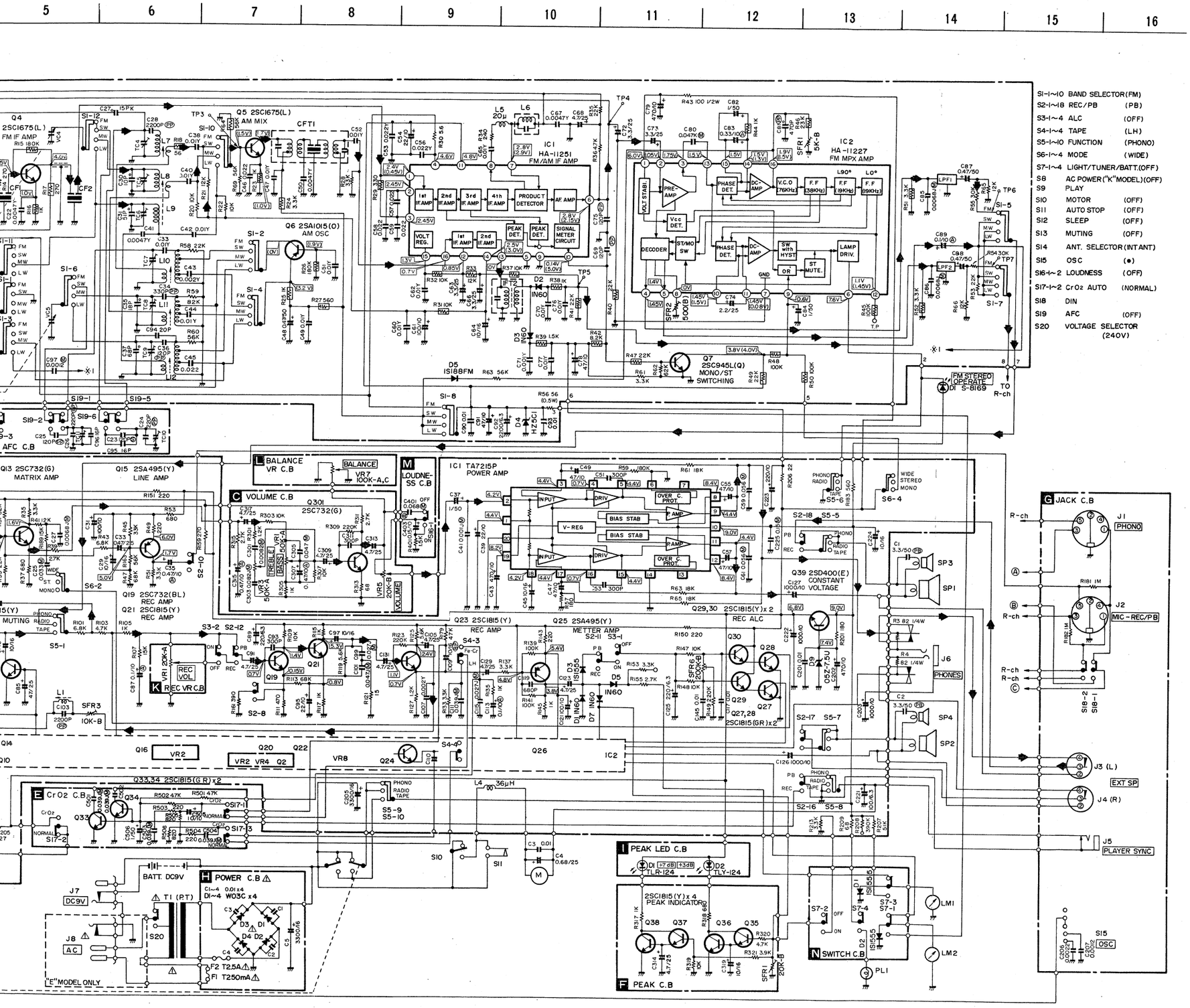
ACCESSORIES/PACKAGE

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1	82-541-857-01		Printed indiv., Packing	*	1
2	82-541-852-01		Cushion L, Printed indiv.	*	1
3	82-541-853-01		Cushion R, Printed indiv.	*	1
4	87-051-137-01		Poly-vinyl sack (for AC power cord)		1
5	87-056-607-01		Poly-vinyl sack (for case)		1
6a	82-541-910-01		Instructions booklet (E model only)	*	1
6b	82-541-906-01		Instructions booklet (K model only)	*	1
7	82-541-907-01		Label, POP	*	1
8	87-051-171-01		Poly-vinyl sack (for instruction)		1
9	87-056-009-01		Distributors list		1
10	80-291-658-01		Tape cassette DMC-147		1
11a	87-034-883-01		AC power cord (E model only)		1
11b	87-034-871-01		AC power cord (K model only)		1
12	87-047-061-01		Battery SUM-1AE		6
13	87-056-008-01		Label, AC power cord (K model only)		1
14	87-056-016-01		Tag, Main voltage (K model only)		1
15	87-058-025-01		Head cleaning pole ass'y		1

AIWA

SCHEMATIC DIAGRAM

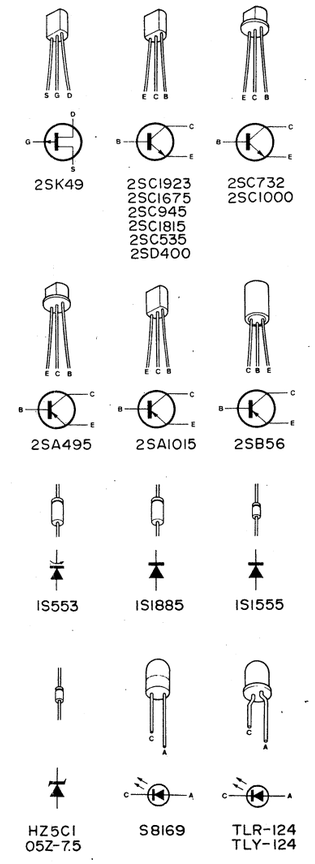




NOTES:

1) —— B (+) power supply
2) ➡ Signal path
   ➡ Rec path, AM signal path.
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
   But ( ) is with AM reception or recording.
   An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
4) Resistors with no designation have a rated power of ¼W and a tolerance of ±5%.
5) Capacitors with no designation have a dielectric strength of less than 50WV.
6) The only capacitor tolerances indicated are ±5% (J) and ±10% (K).
7) Ceramic capacitor symbols:
   For temperature compensation (SL)
   High dielectric constant system (YY)
   High dielectric constant system (YW, YP, YZ)
   Semiconductor ceramic
8) Explanation of symbols:
   (M) Mylar capacitor
   (A) Aluminum solid capacitor
   (PP) Polypropylene film capacitor
   Printed resistor
   Fuse resistor
   ⚠ Safety component symbol
   This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

- This schematic diagram is subject to change without notice in the interests of imporoved performance.



ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
≪TUNER CIRCUIT BOARD SECTION≫		
PCB-A	82-541-662-01	Tuner circuit board
IC1	87-027-285-01	IC, HA-11251
IC2	87-027-296-01	IC, HA-11227
Q1	87-026-109-01	FET, 2SK49 (E2)
Q2	89-319-232-01	Transistor, 2SC1923 (R)
Q3	89-305-352-01	Transistor, 2SC535 (B)
Q4,5	89-316-752-01	Transistor, 2SC1675 (L)
Q6	89-110-153-01	Transistor, 2SA1015 (O)
Q7	89-309-455-01	Transistor, 2SC945L (Q)
D1	88-052-553-01	Diode, 1S553
D2,3	88-051-060-01	Diode, 1N60
D4	87-027-286-01	Zener diode, HZ5C1
D5	88-052-188-11	Diode, 1S188 (FM)
L1	82-539-657-01	FM antenna coil
L2	82-546-601-01	FM RF coil
L3	87-007-088-01	FM OSC coil, 2¼t
L4	87-005-101-01	FM choke coil, 2.2μH
L5	87-005-104-01	Coil, 20μH
L6	87-008-182-01	FM IFT
L7	82-539-651-01	SW antenna coil
L8,9	82-541-642-01	LW, MW bar antenna coil
L10	87-007-092-01	SW OSC coil
L11	87-007-057-01	MW OSC coil
L12	82-479-664-11	LW OSC coil
VC1~5 TC2,3,7,8	87-011-105-01	PVC
TC1,4,5,6	87-011-099-01	Trimmer
TC9	85-708-604-21	Trimmer
TC10	87-011-021-01	Trimmer, 1AT-54
CF1,2	87-008-169-01	FM ceramic filter
CFT1	87-008-162-01	AM ceramic filter transformer (E model only)
CFT1	87-008-150-01	Ceramic filter transformer (K model only)
IFT1	87-008-174-01	FM IFT
IFT2	87-008-164-01	AM IFT
LPF1,2	87-028-038-01	Low-pass filter
S1	82-541-688-01	Rotary switch (BAND SELECTOR)
SFR1	87-021-466-01	Semi-fixed resistor, 5kΩ-B
SFR2	87-021-527-01	Semi-fixed resistor, 500Ω-B
	87-032-534-01	Pin, 4P
PCB-O	82-541-663-01	Relay circuit board
		< **Capacitors** >
C89	87-015-311-01	0.1μF 10V Aluminum solid
C83	87-015-320-01	0.33μF 10V Aluminum solid
C36,69,75	87-014-035-01	120pF PP
C34	87-014-045-01	330pF PP
C81	87-014-049-01	470pF PP
C28	87-014-065-01	2200pF PP
C52	89-663-815-01	0.01μF Semiconductor
C45,46,53, 56,57,58, 59	87-017-003-01	0.022μF Semiconductor
≪REC/PB CIRCUIT BOARD SECTION≫		
PCB-B	82-541-652-11	REC/PB circuit board
IC1,2	87-027-227-01	IC, TA-7215P
Q1,2,11,12, 19,20	89-307-326-01	Transistor, 2SC732 (BL)
Q3,4,7,8, 13,14	89-307-325-01	Transistor, 2SC732 (G)
Q5,6	89-310-006-01	Transistor, 2SC1000 (BL)
Q9,10,21, 22,23,24, 29,30	89-318-154-01	Transistor, 2SC1815 (Y)
Q15,16,25, 26	89-104-954-01	Transistor, 2SA495 (Y)
Q27,28	89-318-155-01	Transistor, 2SC1815 (GR)
Q31,32	89-200-562-01	Transistor, 2SB56 (B)
Q39	89-404-005-01	Transistor, 2SD400 (E)
D1,2,5,6, 7,8	88-051-060-01	Diode, 1N60
D3,4	87-027-097-01	Diode, 1S1555
D9	87-027-228-01	Zener diode, 05Z-7.5 (U)
L1,2	87-003-044-01	Trap coil
L3	82-401-661-01	Choke coil, 600μH
L4	87-003-039-01	Choke coil, 36μH
L5	82-418-612-01	Bias OSC coil
S2	82-533-608-01	Slide switch (REC/PB)
S3,4	82-541-604-01	Lever switch (ALC,TAPE)
S5	82-541-606-01	Lever switch (FUNCTION)
S6	82-541-605-01	Lever switch (MODE)
SFR1,2	87-021-239-01	Semi-fixed resistor, 50kΩ-B
SFR3,4	87-021-357-01	Semi-fixed resistor, 10kΩ-B
SFR5	87-021-358-01	Semi-fixed resistor, 20kΩ-B
SFR6	87-021-454-01	Semi-fixed resistor, 200kΩ-B
		< **Capacitors** >
C87,88, 113,114	87-015-311-01	0.1μF 10V Aluminum solid
C35,36	87-015-314-01	0.47μF 10V Aluminum solid
C109,110	87-015-141-01	10μF 16V Electrolytic BP
C103,104	87-014-065-01	2200pF PP
≪VOLUME CIRCUIT BOARD SECTION≫		
PCB-C	82-541-616-11	Volume circuit board
Q301,302	89-307-325-01	Transistor, 2SC732 (G)
VR1,2,3,4	82-541-623-01	Volume, 50kΩ-A (BASS, TREBLE)
VR5,6	82-541-646-01	Volume, 20kΩ-B (VOLUME)
		< **Capacitor** >
C307,308, 315,316	87-015-314-01	0.47μF 10V Aluminum solid
≪JACK CIRCUIT BOARD SECTION≫		
PCB-D	82-541-658-01	Jack circuit board
J1~5	82-541-639-01	Jack plate ass'y (PHONO, MIC-REC/PLAY, EXT·SP, PLAYER SYNC)
S15	82-541-647-01	Slide switch (OSC)
≪CrO_2 CIRCUIT BOARD SECTION≫		
PCB-E	82-541-654-01	CrO_2 circuit board
Q33,34	89-318-155-01	Transistor, 2SC1815 (GR)
S17	87-031-381-01	Slide switch (CrO_2)
≪PEAK CIRCUIT BOARD SECTION≫		
PCB-F	82-541-669-01	Peak circuit board
Q35,36,37, 38	89-318-154-01	Transistor, 2SC1815 (Y)
SFR1	87-021-434-01	Semi-fixed resistor, 20kΩ-B
≪POWER CIRCUIT BOARD SECTION≫		
⚠ PCB-H	87-033-137-01	Power circuit board
D1~4	87-027-247-01	Diode, W03C
⚠ F1	87-035-145-01	Fuse, "T" 250mA
	87-098-010-01	Fuse label, "T" 250mA

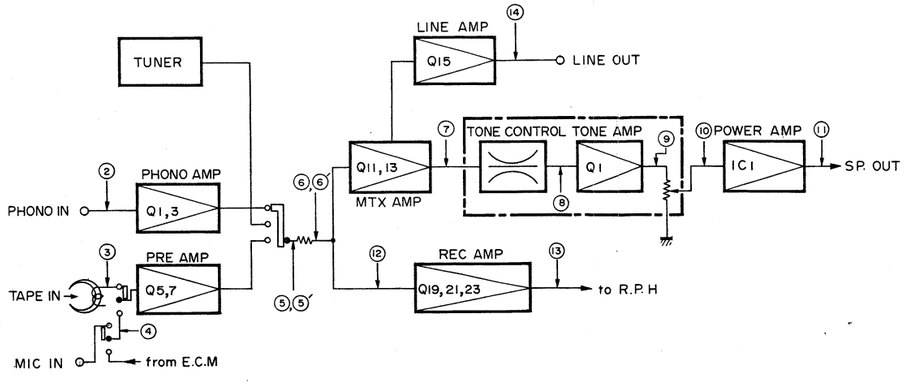
MODEL NO. TPR-950E,K

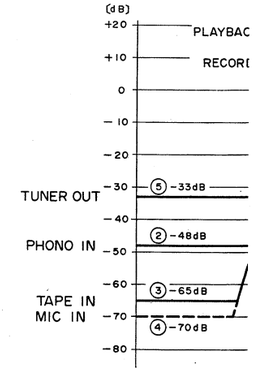
Symbol No.	Part No.	Description
⚠ F2	87-035-139-01	Fuse "T" 2.5A
	87-098-020-01	Fuse label, "T" 2.5A
	87-032-323-01	Fuse clamp
≪PEAK LED CIRCUIT BOARD SECTION≫		
PCB-I	82-541-667-01	Peak LED circuit board
D1	87-027-262-01	Light emitting diode, TLR-124 (PEAK + 7 dB)
D2	87-027-263-01	Light emitting diode, TLY-124 (PEAK + 3 dB)
≪BAND & AFC CIRCUIT BOARD SECTION≫		
PCB-J	82-541-649-01	Band & AFC circuit board
S19	82-541-643-01	Push switch (49 m band AFC)
TC10	87-011-021-01	Trimmer, 1AT-54
TC11	85-708-604-21	Trimmer
		< **Capacitor** >
C23,25	87-014-035-01	120pF PP
C24,26	87-014-041-01	220pF PP
≪REC VOLUME CIRCUIT BOARD SECTION≫		
PCB-K	82-541-668-01	REC volume circuit board
VR1,2	82-541-625-01	Volume, 20kΩ-A (REC VOLUME)
≪BALANCE VOLUME CIRCUIT BOARD SECTION≫		
PCB-L	82-541-666-01	Balance volume circuit board
VR7,8	82-541-624-01	Volume, 100kΩ-A (BALANCE)
≪LOUDNESS CIRCUIT BOARD SECTION≫		
PCB-M	82-541-653-01	Loudness circuit board
S16	82-541-644-01	Push switch (LOUDNESS)
		< **Capacitor** >
C403,404	87-015-367-01	0.15μF 10V Aluminum solid

Symbol No.	Part No.	Description
≪SWITCH CIRCUIT BOARD SECTION≫		
PCB-N	82-541-629-21	Switch circuit board
D1,2	87-027-097-01	Diode, 1S1555
S7	82-541-603-01	Slide switch (LIGHT/T BATT)
≪MISCELLANEOUS≫		
⚠ T1	82-541-645-11	Power transformer
D1	87-027-218-01	Light emitting diode, S (OPERATE/FM STER
RPH	87-046-158-01	REC/PB head
EH	87-046-127-01	Erase head
ECM1,2	85-868-019-01	ECM, CMU-9 (B)
M	87-045-111-01	Motor
PL1	82-540-609-01	Pilot lamp (DIAL)
SP1,2	82-541-685-01	Speaker, Woofer
SP3,4	82-541-609-01	Speaker, Tweeter
LM1	82-541-610-01	Level meter A, L
LM2	82-541-611-01	Level meter B, R
⚠ S8	87-031-479-01	Push switch (AC POWE (K model only)
S9,10	87-031-419-01	Micro switch (PLAY, I
S11	87-031-393-01	Leaf switch (AUTO ST
S12	87-031-418-01	Micro switch (SLEEP)
S14	82-541-607-01	Slide switch (ANT SEL
⚠ S20	87-031-364-01	Slide switch (VOLTAC
J6	87-032-881-01	Jack 6.3φ (PHONES)
J7	82-266-214-11	DC jack
⚠ J8	87-032-434-01	AC jack
J9	82-488-656-01	FM DIN antenna termi
	87-036-013-01	RH core
		< **Capacitor** >
C1,2	82-981-610-01	3.3μF 50V Elect

⚠: Safety component symbol
This symbol is given to important parts whic maintain the safety of the product, and which a conform to special safety specifications. There replacing a component with this symbol, make sure that you use a designated part.

LEVEL DIAGRAM





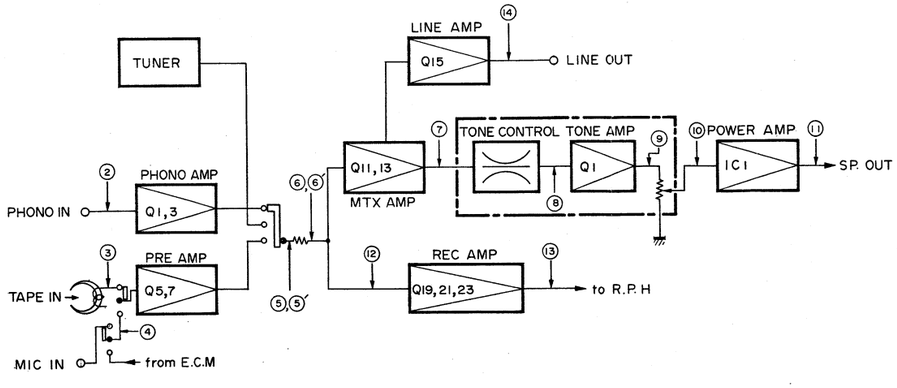
Symbol No.	Part No.	Description
0,21,	89-318-154-01	Transistor, 2SC1815 (Y)
23,24,		
30		
16,25,	89-104-954-01	Transistor, 2SA495 (Y)
28	89-318-155-01	Transistor, 2SC1815 (GR)
32	89-200-562-01	Transistor, 2SB56 (B)
	89-404-005-01	Transistor, 2SD400 (E)
2,5,6,	88-051-060-01	Diode, 1N60
	87-027-097-01	Diode, 1S1555
	87-027-228-01	Zener diode, 05Z-7.5 (U)
	87-003-044-01	Trap coil
	82-401-661-01	Choke coil, 600μH
	87-003-039-01	Choke coil, 36μH
	82-418-612-01	Bias OSC coil
	82-533-608-01	Slide switch (REC/PB)
	82-541-604-01	Lever switch (ALC,TAPE)
	82-541-606-01	Lever switch (FUNCTION)
	82-541-605-01	Lever switch (MODE)
1,2	87-021-239-01	Semi-fixed resistor, 50kΩ-B
3,4	87-021-357-01	Semi-fixed resistor, 10kΩ-B
5	87-021-358-01	Semi-fixed resistor, 20kΩ-B
6	87-021-454-01	Semi-fixed resistor, 200kΩ-B
		< **Capacitors** >
88,	87-015-311-01	0.1μF 10V Aluminum solid
3,114		
36	87-015-314-01	0.47μF 10V Aluminum solid
9,110	87-015-141-01	10μF 16V Electrolytic BP
3,104	87-014-065-01	2200pF PP
≪VOLUME CIRCUIT BOARD SECTION≫		
-C	82-541-616-11	Volume circuit board
1,302	89-307-325-01	Transistor, 2SC732 (G)
,2,3,4	82-541-623-01	Volume, 50kΩ-A (BASS, TREBLE)
5,6	82-541-646-01	Volume, 20kΩ-B (VOLUME)
		< **Capacitor** >
7,308,	87-015-314-01	0.47μF 10V Aluminum solid
5,316		
≪JACK CIRCUIT BOARD SECTION≫		
-D	82-541-658-01	Jack circuit board
5	82-541-639-01	Jack plate ass'y (PHONO, MIC-REC/PLAY, EXT·SP, PLAYER SYNC)
	82-541-647-01	Slide switch (OSC)
≪CrO_2 CIRCUIT BOARD SECTION≫		
-E	82-541-654-01	CrO_2 circuit board
,34	89-318-155-01	Transistor, 2SC1815 (GR)
	87-031-381-01	Slide switch (CrO_2)
≪PEAK CIRCUIT BOARD SECTION≫		
-F	82-541-669-01	Peak circuit board
5,36,37,	89-318-154-01	Transistor, 2SC1815 (Y)
3		
R1	87-021-434-01	Semi-fixed resistor, 20kΩ-B
≪POWER CIRCUIT BOARD SECTION≫		
-H	87-033-137-01	Power circuit board
~4	87-027-247-01	Diode, W03C
	87-035-145-01	Fuse, "T" 250mA
	87-098-010-01	Fuse label, "T" 250mA

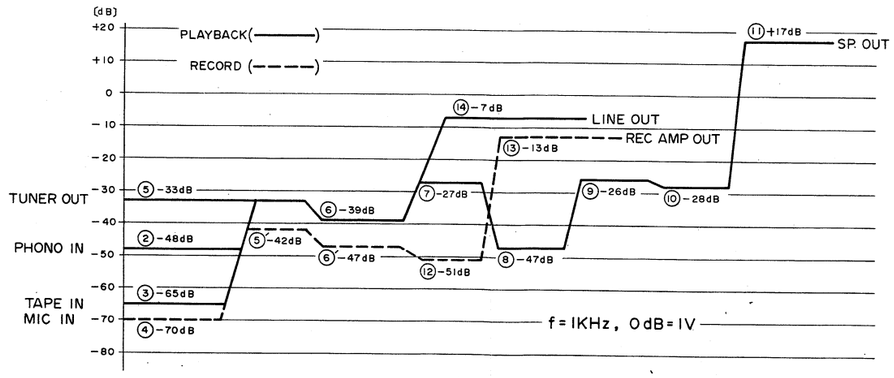
Symbol No.	Part No.	Description
⚠F2	87-035-139-01	Fuse "T" 2.5A
	87-098-020-01	Fuse label, "T" 2.5A
	87-032-323-01	Fuse clamp
≪PEAK LED CIRCUIT BOARD SECTION≫		
PCB-I	82-541-667-01	Peak LED circuit board
D1	87-027-262-01	Light emitting diode, TLR-124 (PEAK + 7 dB)
D2	87-027-263-01	Light emitting diode, TLY-124 (PEAK + 3 dB)
≪BAND & AFC CIRCUIT BOARD SECTION≫		
PCB-J	82-541-649-01	Band & AFC circuit board
S19	82-541-643-01	Push switch (49 m band AFC)
TC10	87-011-021-01	Trimmer, 1AT-54
TC11	85-708-604-21	Trimmer
		< **Capacitor** >
C23,25	87-014-035-01	120pF PP
C24,26	87-014-041-01	220pF PP
≪REC VOLUME CIRCUIT BOARD SECTION≫		
PCB-K	82-541-668-01	REC volume circuit board
VR1,2	82-541-625-01	Volume, 20kΩ-A (REC VOLUME)
≪BALANCE VOLUME CIRCUIT BOARD SECTION≫		
PCB-L	82-541-666-01	Balance volume circuit board
VR7,8	82-541-624-01	Volume, 100kΩ-A (BALANCE)
≪LOUDNESS CIRCUIT BOARD SECTION≫		
PCB-M	82-541-653-01	Loudness circuit board
S16	82-541-644-01	Push switch (LOUDNESS)
		< **Capacitor** >
C403,404	87-015-367-01	0.15μF 10V Aluminum solid

Symbol No.	Part No.	Description
≪SWITCH CIRCUIT BOARD SECTION≫		
PCB-N	82-541-629-21	Switch circuit board
D1,2	87-027-097-01	Diode, 1S1555
S7	82-541-603-01	Slide switch (LIGHT/TUNER/BATT)
≪MISCELLANEOUS≫		
⚠T1	82-541-645-11	Power transformer
D1	87-027-218-01	Light emitting diode, S8169 (OPERATE/FM STEREO)
RPH	87-046-158-01	REC/PB head
EH	87-046-127-01	Erase head
ECM1,2	85-868-019-01	ECM, CMU-9 (B)
M	87-045-111-01	Motor
PL1	82-540-609-01	Pilot lamp (DIAL)
SP1,2	82-541-685-01	Speaker, Woofer
SP3,4	82-541-609-01	Speaker, Tweeter
LM1	82-541-610-01	Level meter A, L
LM2	82-541-611-01	Level meter B, R
⚠S8	87-031-479-01	Push switch (AC POWER) (K model only)
S9,10	87-031-419-01	Micro switch (PLAY, MOTOR)
S11	87-031-393-01	Leaf switch (AUTO STOP)
S12	87-031-418-01	Micro switch (SLEEP)
S14	82-541-607-01	Slide switch (ANT SELECTOR)
⚠S20	87-031-364-01	Slide switch (VOLTAGE SELECTOR)
J6	87-032-881-01	Jack 6.3φ (PHONES)
J7	82-266-214-11	DC jack
⚠J8	87-032-434-01	AC jack
J9	82-488-656-01	FM DIN antenna terminal
	87-036-013-01	RH core
		< **Capacitor** >
C1,2	82-981-610-01	3.3μF 50V Electrolytic BP

⚠: Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

LEVEL DIAGRAM





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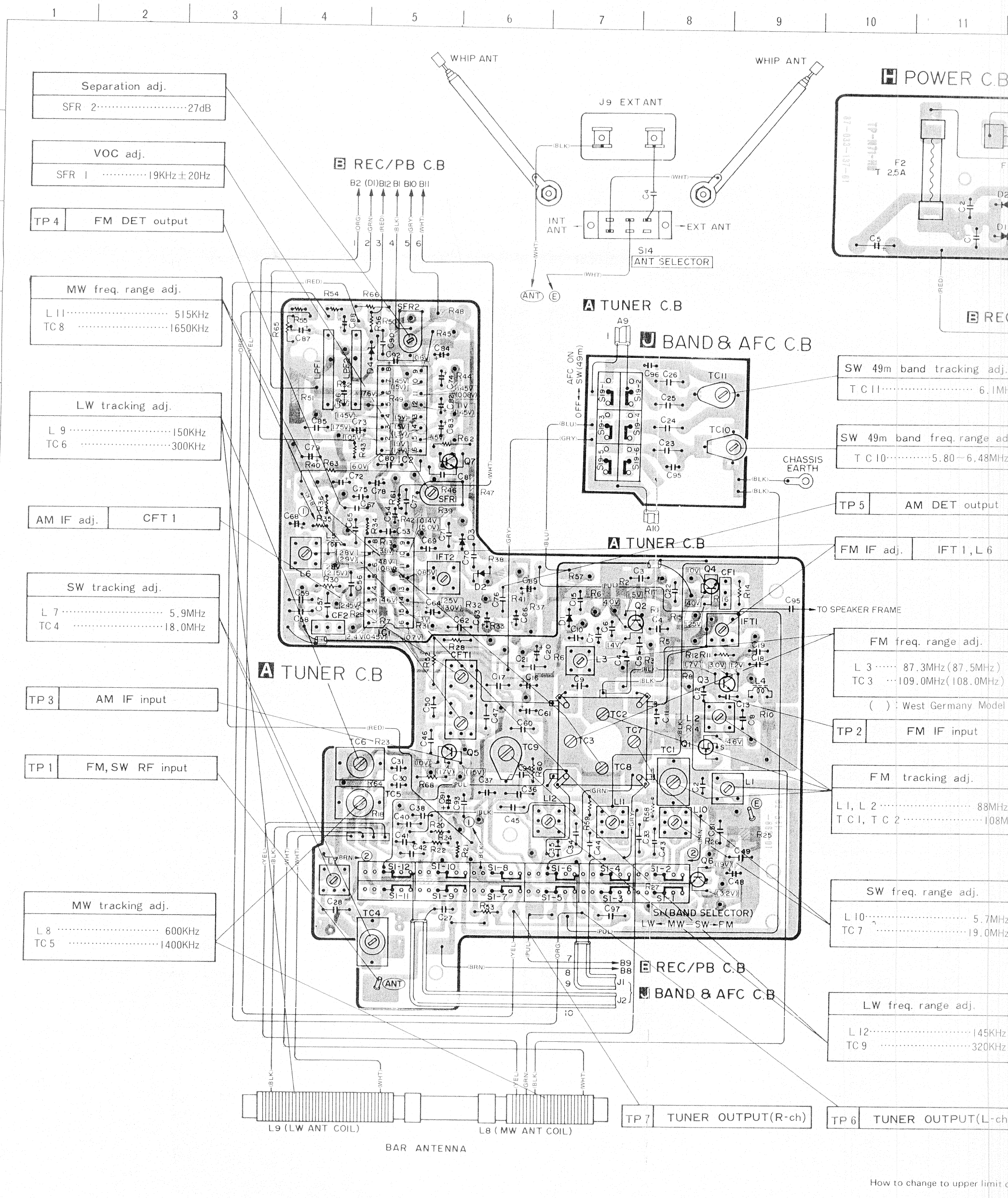
WIRING–1



How to change to upper limit o

Symbol No.	
C2 C9 C11 L2	

NOTES (1) B (+) Pattern Component side pattern Others pattern

(2) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals. But ( ) is with AM reception.

11 12 13 14 15 16 17 18 19

POWER C.B

MODEL TPR-950K ONLY

MODEL TPR-950E ONLY

S8 POWER(AC)

S20 (VOLTAGE SELECTOR)

T1(PT)

J8 AC~

F2 2.5A

F1 T250mA

D1 D2 D3 D4

C1 C2 C3 C4

240V 120V

S12 SLEEP SW

J7 DC9V

J7 DC 9V

B REC/PB C.B

BATT. UM1x6 (DC 9V)

D JACK C.B

J5 GND

J2 J1 J3 J4

R181 R182

S18-1 S18-2

C206 S15 C207

S15 OSC

82 541 657 01

82-541-658-01

J2 MIC-REC/PLAY

J5 PLAYER SYNC

J1 PHONO

J3,4 EXT SP

B5

B4

M LOUDNESS C.B

R401 R402 R403 C401 C402 C403 C404

S16 LOUDNESS

C VOLUME C.B

Q301 Q302

R301 R302 R303 R304 R305 R306 R307 R308 R309 R310 R311 R312 R313 R314 R315 R316

C301 C302 C303 C304 C305 C306 C307 C308 C309 C310 C311 C312 C313 C314 C315 C316 C317 C318

VR1 VR2 VR3 VR4 VR5 VR6

BASS TREBLE VOLUME

B6 B3 B7

L BALANCE VR C.B

VR7 VR8

(L) (R)

BALANCE

m band tracking adj. 6.1MHz

band freq. range adj. .....5.80~6.48MHz

AM DET output

adj. IFT 1, L 6

AME

1 freq. range adj.

··· 87.3MHz(87.5MHz)

···109.0MHz(108.0MHz)

() : West Germany Model

FM IF input

M tracking adj.

..... 88MHz

C 2 .....108MHz

freq. range adj.

..... 5.7MHz

.....19.0MHz

freq. range adj.

.....145KHz

.....320KHz

UNER OUTPUT(L-ch)

w to change to upper limit of FM frequency range from 108 MHz to 104 MHz.

ymbol No.	Description	108 MHz		104 MHz	
C2	Ceramic Capacitor	20PF	88-212-200-01	33PF	88-212-250-01
C9	Ceramic Capacitor	18PF	88-251-180-01	33PF	88-251-250-01
C11	Ceramic Capacitor	24PF	88-212-220-01	27PF	88-212-230-01
L2	FM RF Coil	2-1/2t	82-546-601-01	Separate Coil from Bobin 1/4t.	

WIRING-2

2. Tape speed adjustment

Setting:
- Test tape: TTA-111A
- Test point: DIN output
- Adjustment location: SFR in motor

Method:
Playback the test tape and adjust so that the frequency is 3 kHz.

6. Bias frequency adjustment

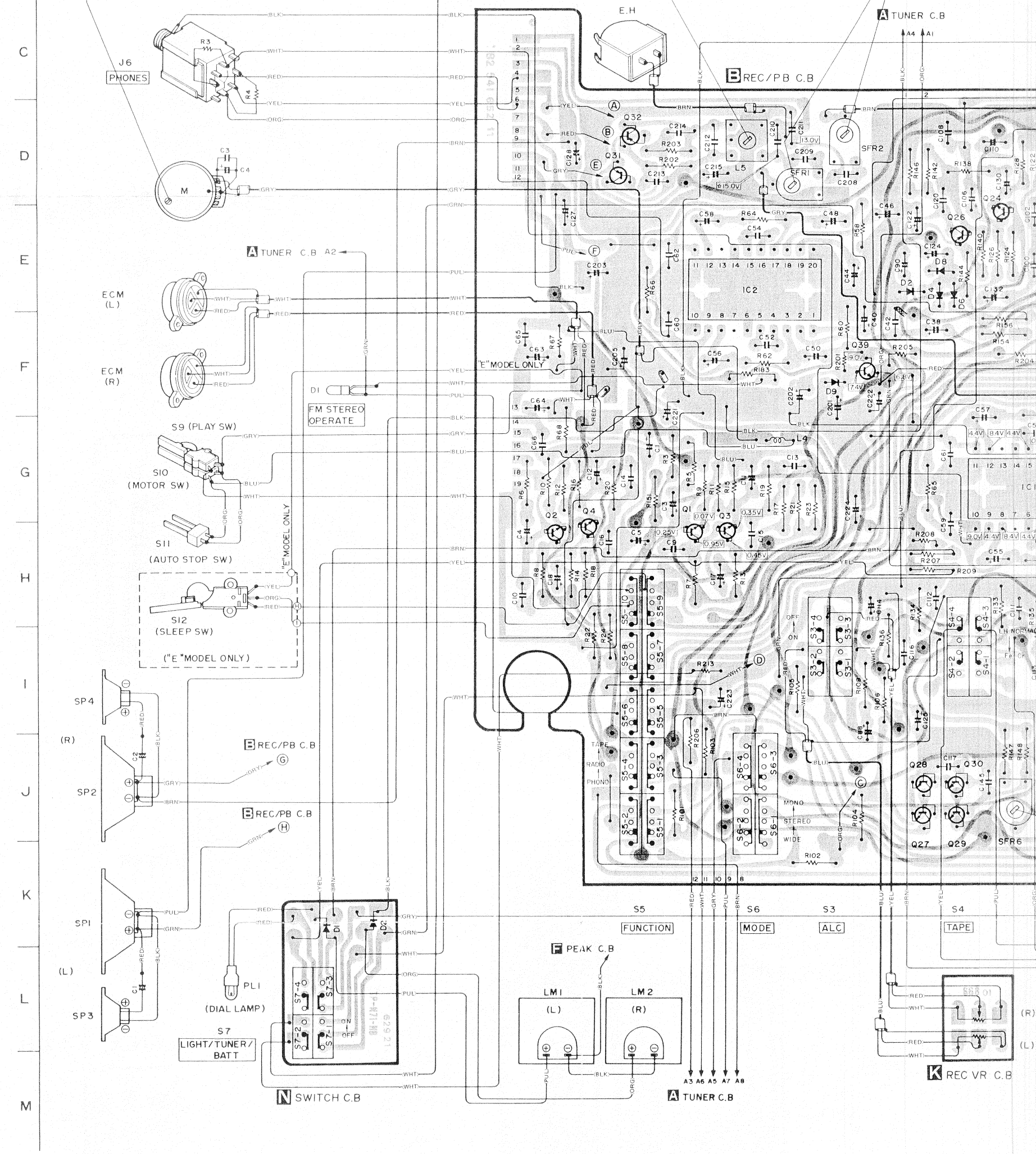
Setting:
- ALC switch: OFF
- REC VOLUME: MIN
- OSC switch: "–"
- Test point: TP1 (or TP2)
- Adjustment location: L5

Method:
Adjust L5 so that the frequency at test point TP1 (or TP2) is 54.5 kHz.

8. Bias current adjustment

Setting:
- Adjustment location: SFR1 (L-ch), SFR2 (R-
*Others setting same as in the bias frequency a
ment.

Method:
Adjust SFR1(2) so that the voltage at test point T
is 20 mV (200 μA).



NOTES (1) B (+) Pattern Component side pattern Others pattern

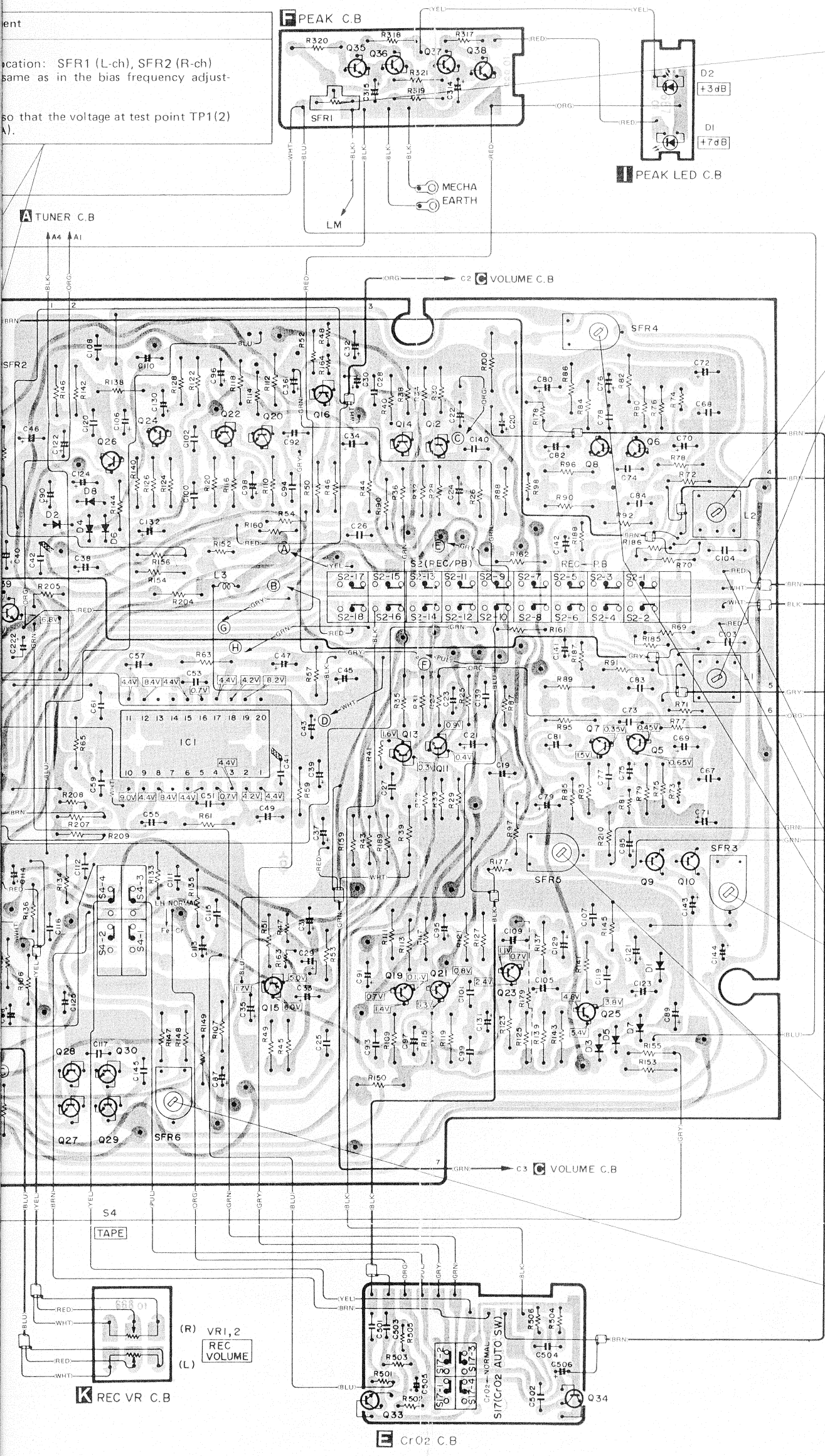
(2) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals. An asterisk (★) indicates that the value was measured with a vacuum-tube voltmeter during recording.

9 10 11 12 13 14 15 16 17 18 19

ent

cation: SFR1 (L-ch), SFR2 (R-ch)
same as in the bias frequency adjust-

so that the voltage at test point TP1(2)
A).



TP 2	Bias test point(R-ch)
TP 1	Bias test point(L-ch)

9. Peak indicator adjustment

Setting:
- MIC input: —70 dB, 1 kHz (0 dB = 1V)
- ALC switch: OFF
- REC VOLUME: MAX
- Adjustment location: SFR1

Method:
Adjust SFR1 so that the yellow LED lights up slightly when the recording input is increased by 2 dB. Then confirm that the yellow LED lights up completely when the recording input is increased by 3 dB. Finally, confirm that the red LED lights up when the recording input is increased by 7 dB.

7. Bias trap coil adjustment

Setting:
- Adjustment location: L1 (L-ch), L2 (R-ch)

*Others setting same as in the bias frequency adjustment.

Method:
The voltage is brought to its maximum value.

1. Azimuth adjustment

Setting:
- Test tape: TTA-117
- Test point: DIN output
- Adjustment location: Azimuth adjusting screw

Method:
Output of the 10 kHz section reaches the maximum and same phase for both the left and right channel.

4. Recording current adjustment

Setting:
- MIC input: —70 dB, 1 kHz (0 dB = 1V)
- ALC switch: OFF
- REC VOLUME: MAX
- Test point: TP1 (L-ch), TP2 (R-ch)
- Adjustment location: SFR3 (L-ch), SFR4 (R-ch)

Method:
The voltage becomes the same for both left and right channels.

3. Playback level adjustment

Setting:
- Test tape: TTA-170
- Test point: DIN output
- Adjustment location: SFR5

Method:
The voltage becomes the same for both left and right channels.

5. ALC balance adjustment

Setting:
- MIC input: —50 dB, 1 kHz (0 dB = 1V)
- ALC switch: ON
- Test point: TP1 (L-ch), TP2 (R-ch)
- Adjustment location: SFR6

Method:
The voltage becomes the same for both left and right channels.

hers pattern
when there are no signals.
ltmeter during recording.